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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/776,720	02/06/2001	Takatoshi Kato	50395-086	2375

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600 13th Street, N.W.
Washington, DC 20005-3096

EXAMINER

MOONEY, MICHAEL P

ART UNIT	PAPER NUMBER
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2877

DATE MAILED: 06/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/776,720

Applicant(s)

KATO, TAKATOSHI

Examiner

Michael P. Mooney

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 March 2004.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 9-14 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-6 and 9-14 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Since it has only recently been made clear in the prosecution that the patentability of claims 1-6 hinges upon the loss of the module at the 1550 nm wavelength being "not more than 0.035 dB per unit kilometer of said optical transmission fiber", it is imperative that the record be made clear with respect to what type of loss is being referred to in the said claims. The loss could be of a type that fits in one of the following 2 categories:

- 1) attenuation due to curvature (i.e., bending loss); or
- 2) total attenuation loss.

If the loss is "category 1" (curvature), then the prior art (e.g., the Sillard et al. reference) renders the "not more than 0.035 dB per unit kilometer of said optical transmission fiber" unpatentable (as delineated in the rejection below).

If the loss is of "category 2" (total attenuation), then there are enablement issues in the Specification because it is not clear from the prior art how total attenuation losses of the module at the 1550 nm wavelength being of not more than 0.035 dB per unit kilometer of said optical transmission fiber can be obtained and there is nothing in the Specification which would enable one of ordinary skill in the art to obtain a fiber with such total attenuation parameters without undue experimentation.

Based on the fact that the Specification states that the dispersion compensating optical fibers (DCFs) are "rolled up in a coil as a module" (bottom of page 8), it is reasonable to assume that the loss of the module referred to in claims 1-6 is referring to attenuation due to curvature or bending loss (category 1). Hence, the following

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rejection assumes that the loss of the module referred to in claims 1-6 is referring to attenuation due to curvature or bending loss.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-6, 9-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sillard et al. (6263138) and further in view of Judy et al. (5905838).

Sillard et al. teaches, at col. 3 lines 19-31 and col. 7 lines 27-35, using a line fiber of +6 to +10 ps/nm/km. It would have been prima facie obvious to one of ordinary skill in the art to state chromatic dispersion range as done in claim 1. The MPEP addresses this as follows:

2144.05 Obviousness of Ranges

I. OVERLAP OF RANGES

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In the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a prima facie case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Geisler*, 116 F.3d 1465, 1469-71, 43 USPQ2d 1362, 1365-66 (Fed. Cir. 1997) (Claim reciting thickness of a protective layer as falling within a range of “50 to 100 Angstroms” considered prima facie obvious in view of prior art reference teaching that “for suitable protection, the thickness of the protective layer should be not less than about 10 nm [i.e., 100 Angstroms].” The court stated that “by stating that suitable protection’ is provided if the protective layer is about’ 100 Angstroms thick, [the prior art reference] directly teaches the use of a thickness within applicant’s] claimed range.”). Similarly, a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985) (Court held as proper a rejection of a claim directed to an alloy of “having 0.8% nickel, 0.3% molybdenum, up to 0.1% iron, balance titanium” as obvious over a reference disclosing alloys of 0.75% nickel, 0.25% molybdenum, balance titanium and 0.94% nickel, 0.31% molybdenum, balance titanium.).

Similarly, Sillard et al. teaches, at col. 3 lines 19-31 and col. 7 lines 27-35, using a dispersion slope of less than 0.07 ps/(sq.nm)/km. Again by “obviousness of ranges” (see above) it would have been obvious to one of ordinary skill in the art to state the dispersion slope range of instant claim 1.

Furthermore, Sillard et al., at col. 6 lines 14-30 & col. 7 lines 25-60, teaches a module/section made of a dispersion compensating optical fiber having a chromatic dispersion of -40 ps/nm/km or less and a dispersion slope of -0.10 ps/(sq. nm.)/km or less at the 1550nm wavelength.

Additionally, Sillard et al. teaches the dispersion compensating optical fiber has a length that is sufficient to substantially compensate the chromatic dispersion of the optical transmission fiber at the 1550nm wavelength. (col. 6 lines 14-30 & col. 7 lines 25-60).

Furthermore, Sillard et al. teaches the loss of the module/section at the 1550 nm

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wavelength is not more than 0.035dB per unit kilometer of the optical transmission fiber.

This is calculated as follows.

The attenuation due to curvature of Sillard's DCF section/module, e.g., using the DCF described at Sillard et al. col. 6 lines 14-30, is less than or equal to $1\text{E-}5$ dB (i.e., "one times ten to the negative 5 decibels") for 100 turns on a 30mm radius spool. Using these numbers, one can easily calculate the attenuation due to curvature for this fiber to be $5.31\text{E-}4$ dB/km.

Using $5.31\text{E-}4$ dB/km in the example given in Sillard et al. at col. 7 lines 25-60, it is clear that the attenuation due to curvature of Sillard's 14km DCF section/module is

$$(5.31\text{E-}4 \text{ dB/km}) \times (14\text{km}) = 7.43\text{E-}3\text{dB}.$$

Dividing $7.43\text{E-}3\text{dB}$ by 100km (which is analogous to the Applicant dividing 2.8dB by 80km to obtain 0.035dB/km for claims 1-6) yields a loss of the module at the 1550 nm wavelength of not more than $7.43\text{E-}5$ dB per unit kilometer of the optical transmission fiber. Hence, since $7.43\text{E-}5$ dB/km is less than 0.035 dB/km, Sillard et al. teaches the loss of the module/section at the 1550 nm wavelength is not more than 0.035 dB per unit kilometer of the optical transmission fiber.

Thus, claim 1 is rejected.

Under the "obviousness of ranges" rationale from the MPEP (see above), Sillard et al., at col. 3 lines 19-31, renders the dispersion slope range of claim 2 as obvious.

Thus, claim 2 is rejected.

Sillard et al., at col. 3 lines 25-30, teaches an effective area that is 45 square micrometers or more. Thus claim 3 is rejected.

At col. 7 lines 5-20, Sillard et al. teaches a chromatic dispersion that is -80 ps/(nm.)/km or less and a dispersion of -0.20 ps/(sq. nm.)/km or less. Thus claim 4 is rejected.

At col. 7 lines 5-20, Sillard et al. teaches a chromatic dispersion that is -100 ps/(nm.)/km or less. Thus claim 5 is rejected.

Claim 6 is rendered obvious by the above reasons and references and because of the fact that it is notoriously well known (NWK) to use a transmitter and a receiver with such devices. Thus claim 6 is rejected.

Claim 9 is rendered obvious by the above reasons and references. The average chromatic dispersion in the transmission line example of Sillard et al. at, e.g., col. 7 lines 25-60, is zero (col. 7 lines lines 49-54). Zero is not less than -2 ps/(nm.)/km and not more than $+2$ ps/(nm.)/km. Thus claim 9 is rejected.

Claim 10 is rendered obvious by the above reasons and references. The average chromatic dispersion in the transmission line example of Sillard et al. at, e.g., col. 7 lines 25-60, is zero (col. 7 lines lines 49-54). Zero is not less than -1 ps/(nm.)/km and not more than $+1$ ps/(nm.)/km. Thus claim 10 is rejected.

By the above reasons and references claims 11-14 are rejected.

Response to Arguments

Applicant's arguments filed 3/16/04 have been fully considered but they are not persuasive. Although there is adequate descriptive support for 0.035 dB/km, the claimed subject matter is still not patentable as elucidated in the above rejection.

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Furthermore, Although there is adequate descriptive support for average chromatic dispersion range of not less than -2 and not more than 2, and not less than -1 and not more than 1, the units being ps/nm/km, the claimed subject matter is still not patentable as elucidated in the above rejection.

The above rejection(s)/reasoning either respond to and/or render as moot any additional Remarks/Arguments made by the Applicant in the 3/16/04 filing.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael P. Mooney whose telephone number is 571-272-2422. The examiner can normally be reached during weekdays, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on 571-272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-

1562.


Michael P. Mooney
Examiner
Art Unit 2877


Frank G. Font
Supervisory Patent Examiner
Art Unit 2877

FGF/mpm
6/4/04